

"Amendment to the Claims"

1. (currently amended) A method of forming a chalcogenide comprising device comprising:

forming a first conductive electrode material on a substrate;

forming a metal doped chalcogenide comprising material over the first conductive electrode material, the chalcogenide comprising material comprising the metal and A,B,_x where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table, the metal doped chalcogenide comprising material having an outer surface, the outer surface having an uneven surface characteristic;

forming a passivating material over the outer surface of the metal doped chalcogenide comprising material; and

depositing a second conductive electrode material over the passivating material, and forming the second conductive electrode material into an electrode of the device

wherein the passivating material is sufficient to improve the uneven surface characteristic such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide comprising material is protected from being etched.

2. (original) The method of claim 1 comprising forming the second electrode material to be continuous and completely covering at least over the chalcogenide comprising material.

3. (original) The method of claim 1 comprising forming the passivating material to be continuous and completely covering at least over the chalcogenide comprising material.

4. (original) The method of claim 1 comprising forming the passivating material not to be continuous and not to be completely covering at least over the chalcogenide comprising material.

5. (withdrawn)

6. (original) The method of claim 1 wherein the forming of the passivating material comprises exposing the substrate to a temperature elevated from ambient room temperature prior to the depositing.

7-8. (withdrawn)

9. (original) The method of claim 1 wherein the passivating material is formed to a thickness from 1 Angstrom to 100 Angstroms.

10. (original) The method of claim 1 wherein the passivating material is formed to a thickness from 1 Angstrom to 50 Angstroms.

11. (currently amended) A method of forming a chalcogenide comprising device, comprising:

forming a first conductive electrode material on a substrate;

forming a metal doped chalcogenide comprising material over the first conductive electrode material, the chalcogenide comprising material comprising the metal and A,B,, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table, the metal doped chalcogenide comprising material having an outer surface with an uneven surface characteristic;

forming a passivating material [over] on the outer surface of the metal doped chalcogenide comprising material; and

depositing a second conductive electrode material over the passivating material, and forming the second conductive electrode material into an electrode of the device,

wherein the passivating material is sufficient to improve the uneven surface characteristic such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide comprising material is protected from being etched.

12. (original) The method of claim 11 comprising forming the passivating material to be continuous and completely covering at least over the chalcogenide comprising material.

13. (original) The method of claim 11 comprising forming the passivating material not to be continuous and not to be completely covering at least over the chalcogenide comprising material.

14. (original) The method of claim 11 wherein the atmosphere comprises oxygen.

15. (original) The method of claim 11 wherein the atmosphere is substantially void of oxygen.

16. (original) The method of claim 11 wherein the passivating material comprises an outer portion of the metal doped chalcogenide comprising material which is at least in part characterized by a higher concentration of "A" than metal doped chalcogenide comprising material immediately inwardly theretadacent.

17- 89. (withdrawn)

90. (new) The method of claim 1, wherein the uneven surface characteristic is in the form of nodules.

91. (new) The method of claim 90, wherein the nodules are semicircular.

92. (new) The method of claim 90, wherein the nodules are formed of a metal selenide.

93. (new) The method of claim 92, wherein the metal selenide is silver selenide.

94. (new) The method of claim 90, wherein the nodules are from 50 Angstroms to 20 micrometers across.

95. (new) The method of claim 1, wherein the uneven surface characteristic is the result of metal doping of a chalcogenide glass.

96. (new) The method of claim 95, wherein the chalcogenide glass includes selenium and germanium.

97. (new) The method of claim 11, wherein the uneven surface characteristic is in the form of semicircular nodules.

98. (new) The method of claim 97, wherein the nodules are from 50 Angstroms to 20 micrometers across.

99. (new) The method of claim 11, wherein the uneven surface characteristic results from a metal selenium oxide formed as the result of silver doping of a chalcogenide glass.

100. (new) A method of forming a chalcogenide comprising device comprising:
forming a first conductive electrode material on a substrate;

forming a metal doped chalcogenide comprising material over the first conductive electrode material, the chalcogenide comprising material comprising the metal and A_xB_y, where "B" is selected from the group consisting of S, Se and Tc and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table, the metal doped chalcogenide comprising material having an outer surface, the outer surface having an uneven surface characteristic;

forming a passivating material over the outer surface of the metal doped chalcogenide comprising material; and

depositing a second conductive electrode material over the passivating material, and forming the second conductive electrode material into an electrode of the device,

wherein the passivating material is sufficient to improve the uneven surface characteristic such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide comprising material is not exposed through the second conductive electrode.

101. (new) A method of forming a chalcogenide comprising device, comprising:
forming a first conductive electrode material on a substrate;

forming a metal doped chalcogenide comprising material over the first conductive electrode material, the chalcogenide comprising material comprising the metal and A,B,, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table, the metal doped chalcogenide comprising material having an outer surface with an uneven surface characteristic;

forming a passivating material on the outer surface of the metal doped chalcogenide comprising material; and

depositing a second conductive electrode material over the passivating material, and forming the second conductive electrode material into an electrode of the device,

wherein the passivating material is sufficient to improve the uneven surface characteristic such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide comprising material is not exposed through the second conductive electrode.

wherein the passivating material is sufficient to improve the uneven surface characteristic of the outer surface.

103. (new) The method of claim 102, wherein the uneven surface characteristic is improved such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide layer is protected from being etched.

104. (new) The method of claim 102, wherein the uneven surface characteristic is improved such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide layer is not exposed through the second conductive electrode.

105. (new) A method of forming a chalcogenide comprising device, comprising:
forming a first conductive electrode material on a substrate;

forming a chalcogenide layer comprising a metal doped germanium and selenium chalcogenide over the first conductive electrode material, the chalcogenide layer having an outer surface with an uneven surface characteristic;

forming a passivating material on the outer surface of the metal doped chalcogenide layer; and

depositing a second conductive electrode material over the passivating material, and forming the second conductive electrode material into an electrode of the device,

wherein the passivating material is sufficient to improve the uneven surface characteristic.

106. (new) The method of claim 105, wherein the uneven surface characteristic is improved such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide layer is protected from being etched.

107. (new) The method of claim 105, wherein the uneven surface characteristic is improved such that after subsequent deposition of a second conductive electrode material on the outer surface, the chalcogenide layer is not exposed through the second conductive electrode.